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| APPLICATION NO.  | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|---------------------|------------------|
| 10/587,852   | 07/28/2006  | Nicolas Sarrut       | 294254US0PCT        | 9763             |
| 22850  | 7590        | 03/05/2010           | EXAMINER            |                  |
| OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, L.L.P.<br>1940 DUKE STREET<br>ALEXANDRIA, VA 22314 |             |                      |                     | EOM, ROBERT J    |
| ART UNIT   |             | PAPER NUMBER         |                     |                  |
| 1797   |             |                      |                     |                  |
| NOTIFICATION DATE  |             | DELIVERY MODE        |                     |                  |
| 03/05/2010   |             | ELECTRONIC           |                     |                  |

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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|                              |                        |                     |  |
|------------------------------|------------------------|---------------------|--|
| <b>Office Action Summary</b> | <b>Application No.</b> | <b>Applicant(s)</b> |  |
|                              | 10/587,852             | SARRUT ET AL.       |  |
|                              | <b>Examiner</b>        | <b>Art Unit</b>     |  |
|                              | ROBERT EOM             | 1797                |  |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

1) Responsive to communication(s) filed on 25 January 2010.  
 2a) This action is **FINAL**.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

4) Claim(s) 8-15 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 8-15 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on \_\_\_\_\_ is/are: a) accepted or b) objected to by the Examiner.  
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

|  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)          | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____.<br><br>   | 6) <input type="checkbox"/> Other: _____.                         |

## DETAILED ACTION

### ***Response to Arguments***

1. Applicant's arguments with respect to claims 8-15 have been considered but are moot in view of the new ground(s) of rejection.

The applicant has amended independent claim 8, to further define the channel's structure and shape being planar and with a rectilinear axis relative to the fluidic network, not previously presented, for consideration upon merits for patentability. The applicant has also presented new dependent claim 15, not previously presented for consideration upon merits for patentability.

### ***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 8 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brennen et al. (US 2003/0224531 A1), in view of Bousse et al. (US 2004/0113068 A1).

Regarding claim 8, Brennen discloses a microfluidic device (**Fig. 4, [0048]**) comprising: a support (**see: well plate housing 93**), a thin layer (**see: microfluidic housing 95**) integral with the support and in which the fluidic network (**see: process zones 105**) and electronebulization nozzle are made (**see: triangular cantilevered electrospray nozzles**). The electronebulization nozzle comprising a planar channel (**see: microchannels 109**) which is connected to the fluidic network and the fluid outlet orifice (**see: electrospray emitters 123**), wherein said electronebulization nozzle forms a cantilever end relative to the support such that the channel is parallel to the support's upper surface plane. The channel further having an electrode near the terminus of the electrospray emitter (**[0038]**). Regarding the recitation of a method of making said on-chip laboratory, the examiner notes that the determination of patentability is determined by the recited structure of the apparatus and not by a method of making said structure.

A claim containing a recitation with respect to the manner in which a claimed apparatus is made does not differentiate the claimed apparatus from a prior art apparatus if the prior art apparatus teaches all the structural limitations of the claim.

Brennen does not explicitly disclose the channel having a rectilinear axis relative to the fluidic network.

Bousse teaches a microfluidic chip formed with multiple fluid channels terminating at a common cantilevered electrospray ionization tip (**Fig. 3A**). The channels (**see: relatively inner and outer channels 32 and 34**) having a rectilinear axis relative to the fluidic network (**see: rectangular shape of the channel cross section**). It is well known in the art that microfluidic channels can have a variety of shapes and configurations. The change in configuration of shape of a device is obvious absent persuasive evidence that the particular configuration is significant. . In re Dailey, 357 F.2d 669, 149 USPQ 47 (CCPA 1966). It would have been obvious to one having ordinary skill in the art at the time of the invention to modify the shape of the channels in the microanalytical device of Brennen, as taught by Bousse since an ordinary skilled artisan at the time of the invention would have been motivated to do the foregoing in order to produce a more robust device (**Bousse: [0021] and [0029]**).

Regarding claim 10, modified Brennen discloses all of the claim limitations as set forth above. Brennen further discloses a variety of materials used to form the microanalytical device of the invention (**[0050]-[0052]**), among them are conducting materials such as metals, and polymer laminates such as a polymer coated with copper.

6. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennen et al. (US 2003/0224531 A1), in view of Bousse et al. (US 2004/0113068 A1), as applied to claim 8 above, in further view of Jedrzejewski et al. (US 2003/0013203 A1).

Regarding claim 9, modified Brennen discloses all of the claim limitations as set forth above. Brennen further discloses a variety of materials, including silicon (**[0040]**), the microfluidic device may be manufactured from, selected with regard to physical and chemical characteristics that are desirable for a particular application (**[0050]**). Modified Brennen does not explicitly disclose the electrodes (**[0038]**) being a doped portion of the support, Jedrzejewski teaches electrodes may be incorporated into microfluidic devices in a variety of ways (**[0138]**, **see: processes for incorporating such electrodes are described in USP 5,750,015**). It would have been obvious to one having ordinary skill in the art at the time of the invention to incorporate electrodes into the microanalytical device of modified Brennen through doping a portion of the substrate, as taught by Jedrzejewski, since doing so provides for a flush, seamless electrode which enhances the discharge of liquid from the electrospray emitters.

7. Claims 11-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Brennen et al. (US 2003/0224531 A1), in view of Bousse et al. (US 2004/0113068 A1), as applied to claim 8 above, in further view of Yobas et al. (US 2003/0180965 A1).

Regarding claims 11-12, modified Brennen discloses all of the claim limitations as set forth above. Brennen further discloses a cover hermetically covering the fluidic network (**Fig. 4, see: top plate 97**). Modified Brennen does not explicitly disclose the

cover being provided with a fluid access means at the fluid inlet orifice and being provided with said electrical conduction means. Yobas et al. teaches a micro-fluidic device (**Abstract**) with a channel and inlet orifice (**Fig. 5, see: orifice 204 and channel 204a**). A cover plate (**Fig. 5, see: cover plate 194**) is bonded to the substrate (**Fig. 5, see: substrate 72**). The cover plate has an orifice (**Fig. 5, see: cover plate orifice 200 which provides access to the orifice 204 of the device**). The cover plate further has electrodes which provide the electrical conduction means of the device (**Fig. 5, see: electrodes 190 and 192; [0050]**). It would have been obvious to one having ordinary skill in the art at the time of the invention to use the cover with a fluid access means to the inlet orifice as well as having electrical conduction means on the microfluidic device of modified Brennen, as taught by Yobas, since an inlet orifice provides a way for fluids to be dispensed into, withdrawn or exchanged in the microfluidic device (**Yobas: [0051]**). Integrating electrodes into the lid enhances the functionality of the device (**Yobas: [0051]**) and prevents any possible shorts or electrical issues.

Regarding claims 13 and 14, modified Brennen discloses all of the claim limitations as set forth above. Brennen further discloses a variety of materials used to form the microanalytical device of the invention (**[0050]-[0052]**), among them are conducting materials: such as metals and polymer laminates such as a polymer coated with copper, and semiconducting materials: such as silicon.

8. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Brennen et al. (US 2003/0224531 A1), in view of Bousse et al. (US 2004/0113068 A1), as

applied to claim 8 above, in further view of Ramsey et al. (USP 6,110,343) and Karger et al. (USP 5,872,010).

Regarding claim 15, modified Brennen discloses all of the claim limitations as set forth above. Brennen further discloses the microanalytical device's compatibility with a variety of analytical techniques, including chromatographic separations (**Abstract**). Modified Brennen does not explicitly disclose the fluidic network comprises a chromatography reactor, wherein the chromatography network is connected to the channel by a connector allowing a section restriction between the chromatography network and the channel. Ramsey teaches an electrospray microchip device (**Fig. 12**) which comprises an integrated separation channel for electrophoresis or chromatography (**51**), from which the sample is emitted through the exit orifice (**62**) to an electrospray target electrode (**60**) for further analysis. It would have been obvious to one having ordinary skill in the art at the time of the invention to integrate a separation column into the microanalytical device of modified Brennen, as taught by Ramsey, since doing so would provide for automated combinatorial analysis with a sequenced plurality of analytical techniques (i.e. LC-MS, LC-MALDI, etc.). While Ramsey does not explicitly disclose how the chromatographic separation column is coupled to the electrospray orifice, Karger teaches a microscale fluid handling system (**Fig. 1C**) comprising: a block (**30**) which connects the supply channels (**33**) to the electrospray electrodes (**32**) and the exit tip (**35**). The block provides for a section restriction between the channel and the electrospray exit tip (**Block 30, see: perpendicular interface between the supply channel 33 and channel 12 which comprises the exit tip 35**). It would have been

obvious to provide a connector between the electrospray emitters and fluidic channels in the microanalytical device of modified Brennen, as taught by Karger, since doing so provides for a modular design, facilitating easy replacement or substitution of parts for a more versatile analytical device.

### ***Conclusion***

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ROBERT EOM whose telephone number is (571)270-7075. The examiner can normally be reached on Mon.-Thur., 9:00am-5:00pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on (571)272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Tony G Soohoo/  
Primary Examiner, Art Unit 1797

/R. E./  
Examiner, Art Unit 1797